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FINDLEY

Clemson University Recreation Short Course Project

Dispersed Campsite Rehabilitation Plan for Lake Santeetlah

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Project Purpose and Need and Area Description

Lake Santeetlah was created when construction of the Santeetlah Dam was completed in 1929. The dam was constructed by the Carolina Aluminum Company, since named Tapoco. The primary purpose of this reservoir was to generate power for the operation of the aluminum smelter and fabrication plant at Alcoa, TN. Camping in undeveloped sites along the lake shore began almost as soon as the reservoir was filled. In 1937 most of the property acquired by Tapoco prior to construction of the reservoir was sold to the Forest Service. Tapoco did not sell land lying below the high water mark or land adjacent to the dam.

Since acquisition there has been very little management of this recreational use. The Nantahala/Pisgah Land Management Plan assigned these dispersed camping areas to the Recreation Opportunity Spectrum (ROS) of Roaded Natural. This category calls for a natural appearing setting for all recreational improvements. Most management activity in the area involved attempts to limit vehicle access to existing roadways and the placement of picnic tables. This has led to the current unacceptable situation. At present there are 51 known sites. Most of the environmental damage has been caused by unlimited and undefined vehicle access. The average disturbed area per site is much too large for the current use and to minimize damage to the lake. An additional major problem with these sites is the lack of adequate facilities to deal with human waste and/or the lack of use of the "cat hole" method of burying the waste. These are the primary problems to be addressed for dispersed sites.

Problem Statement:

This project proposes to improve the dispersed camping opportunities around Santeetlah Lake by reducing the pollution caused by sediment and human waste and to beautify these sites by reducing site size. The primary need is to prioritize and schedule work to be accomplished.

Procedure:

The first job was to determine the number of sites in existence, determine work needed, identify practices that would meet these needs, and to prioritize the work needed in order to correct the worst problems first. Prior to beginning the survey, we had to determine what information was needed and to develop a format to record this information. It was decided to utilize the 1:24000 topographic maps to map the site locations. An Inventory Form, to be used with the map, was then developed that collected the following information:

- 1) Written description of map location
- 2) Site sketch giving physical features and distances
- 3) Dimensions of disturbed bare soil areas
- 4) Description of present situation
- 5) Current uses of site
- 6) Area needs
- 7) Recommendations
- 8) Estimated Costs/Materials/Labor to correct problems.
- 9) Priority-High/Low

Field work was accomplished to identify all known sites. Following this stage of the survey, knowledgeable lake users were asked to review the map for identification of additional sites. Each site was visited once and site conditions measured or rated. The inventory was then compiled to analyze the information gathered to summarize and devise strategies for dealing with problems identified. The following Table 1 lists the sites, amount of bare soil, rate of public use, distance to the lake, and priority for rehabilitation. The amount of bare soil rating was field measured. Public use rating was a subjective rating given by Laney Cutshaw, the District's Law Enforcement/Recreation Technician based on the amount of use during 1993. The distance to the lake was measured from the closest points. The Priority rating was also a subjective rating by Laney Cutshaw based on his experience with lake users and amount of environmental damage.

TABLE 1: Site Survey Tabulation

Site	Bare Soil (SqFt)	Public Use (H,M,L)	Distance to Lake(Ft)	Priority (High/Low)	Comments
1	2350	H	80	L	
2	2000	H	10	H	
3	1000	L	500	L	Little damage to lake
4	4125	H	25	L	Day use primary.
5	4200	L	70	L	
6	20000	H	125	H	Contain now!
7	3000	H	10	H	Steps/revegetate
8	2400	L	50	L	
9	3300	H	200	H	
10	3000	L	50	H	Pack in site/
11	3000	L	30	H	Pack in site
12	2200	H	25	L	
13	2000	L	50	L	
14	1500	L	40	L	
15	9450	M	30	L	Rd between lake & site
16	600	H	25	H	
17	1300	H	25	H	
18	3750	H	75	L	Across rd from Lake
19	1500	M	250	H	Toilet serves ramp & site.
20	1500	M	100	L	
21	600	H	200	H	Eliminate/No facilities
22	1200	H	250	L	21,22&23 on same ridge
23	2400	H	225	H	
24	100	H	75	L	
25	600	M	150	L	

TABLE 1: Site Survey Tabulation (Cont.)

Site	Bare Soil (SqFt)	Public Use (H,M,L)	Distance to Lake(Ft)	Priority (High/Low)	Comments
26	500	M	25	H	Close road
27	600	M	150	L	
28	6000	M	50	H	
29	100	H	75	L	Little use
30	600	M	75	L	
31	100	H	10	L	
32	600	H	20	H	Boat access only.
33	600	M	30	L	" " "
34	200	M	25	L	" " "
35	600	L	10	L	
36	400	H	10	H	Pack in site
37	300	H	10	H	" " "
38	350	H	10	H	" " "
39	250	H	10	H	" " "
40	300	H	10	H	" " "
41	900	H	20	H	
42	700	H	125	L	
43	300	H	20	L	
44	500	H	25	L	
45	4000	H	50	H	Fence & Revegetate
46	250	H	30	L	Tent only
47	500	H	25	L	" "
48	400	H	10	L	" "
49	500	H	30	L	
50	900	H	30	H	
51	250	H	25	H	Move dumpsters.

Determination of Problems and Strategies for Correction

Analysis of the each site lead me to conclude that the primary sources of pollutants to the lake were sediment and human waste. Therefore, some of the major factors in setting treatment priorities were the size of the bare area, closeness to lake, number of other sites located nearby, and absence of toilet facilities.

Strategies for dealing with the sedimentation problem include reduction of site size, closure of site, drainage control practices, and site hardening. Site hardening involves the hardening of use areas with either gravel or wood chips and usually definition of the use area with cross ties, poles, or plantings. Reducing site size at these sites is related primarily to restricting vehicle access to designated parking areas. This action protects the site by reducing soil compaction and injury to native vegetation, and by limiting the number of visitors using any one site. Another phenomena causing site enlargement was when a problem developed in a site the visitors would move the activity to another part of the site instead of correcting the problem. A good example is when a pothole developed in a access road. Many visitors instead of draining or filling the pothole would simply start driving over roadside vegetation even if it meant cutting trees and creating a new road. This is more of an indictment of our lack of management than totally inappropriate actions of the visitors. I will be correcting this problem by assigning a Senior Citizen cleanup crew full time to our dispersed sites. They will police the areas make minor corrections and report problems to their supervisor. Previously they had worked these areas only when a problem was detected or they had comleted their other duties. The following are ways of dealing with vehicle control: 1) Placement of gravel to physically indicate areas suitable for vehicles, and 2)Barriers to limit access including posts, boulders, planting of vegetation, large logs, and gates. The preferred method is placement of boulders supplemented with vegetation plantings. In the past placement of posts and logs have failed because people cut them down with chainsaws. We try to avoid the use of gates unless we must maintain administrative access past the point needed for public access. The use of gates is not appropriate in the Roaded Natural settings we are trying to provide. The location, handling, and placement of the boulders and plantings will directly supervised by the Recreation Technician supervisor.

With vehicles limited to certain sections of a site that section will be hardened with gravel. Work consists of hardening the use areas in each site and by reducing site size, if appropriate. We begin by defining where the use site is with crossties or logs buried half way into the ground. Ingress and egress for disabled persons is provided by leaving breaks in the border. The areas within the boundaries are then hardened with gravel, if needed, and woodchips. Once again the goal is to provide a natural appearing setting while protecting the site. This is why woodchips are applied over the gravel even though the gravel is more than adequate to protect the site. Within the site boundaries, usually a table is placed, a fire ring is constructed, and amoveable lantern post is built. The moveable lantern post is a new innovation for the Cheoah District. It is built out of steel pipe with lantern hangers attached at the top and set in a round concrete base. This design allows the post to be rolled where needed and eliminates the need for multiple lantern posts that from evidence on the sites never seems to be in the place needed. This seems to greatly reduce the number of trees damaged by the hanging of lanterns on them. This will eventually make the site more safe and attractive through the elimination of most hazard trees in these sites.

Part of the campsite rehabilitation job is to make sites safer through the removal of hazard trees. Another problem is the maintenance of trees around the campsites. I have found these moveable lantern posts help greatly in preventing damage to these trees. It is very difficult for new trees to become established around use areas, therefore, we want to maintain trees that are currently on site. Any sites that are totally denuded will be closed to public use until trees can be regenerated in the site. For the above measures to work, maintenance of the site is mandatory. We have established a system where a clean up crew visits each site weekly and picks up litter, cleans out the fire rings, and alerts management to any problems identified.

Before or after defining and improving the site layout, site drainage must be considered. Any water entering from offsite is diverted away from the site. Most offsite water is related to either the access road or trail into the site. Most often this can be dealt with by installing broad based dips into access roads and waterbars or steps on access trails. To minimize sedimentation caused by these improvements, large gravel is placed in newly construct road dips and the outlets are being grassed and haybales or a silt fence erected until revegetated. If a large amount of water is being diverted, a small silt basin or grassed waterways will be constructed to allow for the slowing of the water and the dropping of transported sediment to occur before the water enters the lake. Installation of waterbars or steps on the access trail and other trail improvement often reduces the amount of land utilized for site access by 50% or more and therefore lessens the potential sedimentation and improves the naturalness of the site.

If there is still a water drainage problem unrelated to the access road, trail or site hardening, diversion ditches or buried logs will be installed to divert water into undisturbed vegetation. On steeper sites, flattened tents pads are sometimes installed within the hardened area to help confine use to the hardened portions of the site.

To improve the naturalness of the site and reduce sedimentation, planting of shrubs outside the hardened areas is often necessary. This planting will be directed during on site visits by the crew supervisor. Another source of lake sediment is a result of access to the lake. This problem is often easily dealt with through the construction of an access trail with steps approaching the lake. This is used only where it is infeasible to use a site for disabled access due to terrain limitations. We have found this often corrects the problem. It is very important to continually review your site work to determine if the placement of the trail is where needed as shown by visitor use. If not a new trail may be needed as shown by public use of the lake shore where no trail was provided.

Another important aspect of successfully limiting pollution of the lake is unrelated to physical improvements or work on a site. This part involves on site visits with users to educate and receive feedback on the improvements made. During the use season for these sites either a Recreation Technician or a Law Enforcement Officer will make visitor contacts. In addition, to direct public contact, an information board will be installed at each rehabilitated site and will be utilized to impart a knowledge of what our objective for the improvements are and to solicit support. This aspect has been a very important part of our program. We solicited comments prior to implementing any of these changes, tried to incorporate these changes into our plans, and to calm fears that we would be eliminating dispersed camping. We stressed that these actions were taken to, first, improve the camping experience and, secondly, to protect the lakeside environment. At first there was a great deal of skepticism and doubts about our intentions. Recently there have been more positive comments and support for these actions.

In my opinion, a more serious problem is that of human waste disposal. This problem presents a real dilemma when dealing with widely dispersed campsites. Measures to rectify this problem are costly. We have devised several strategies for dealing with the problem. The preferred solution is to install permanent toilets at sites where a number of users concentrate to justify the high expense. We have installed one very successful SST toilet (Sweet Smelling Toilet) and it is working wonderfully. It has been in place for two years, does not stink, and has not been vandalized. The problem with the SST's lies in two areas. One is the cost, approximately \$5-7000 dollars for purchase and \$750 for installation. The other is that the appearance does not meet the Recreation Opportunity Spectrum we are trying to achieve in these areas. At present, the Forest Landscape Architect is designing a pre-fabricated toilet incorporating SST principles in materials more appropriate for these sites.

The second option in dealing with the human waste problem is less costly but still very dependent of proper funding, while still inappropriate for the ROS setting: the rental of Porta-Toilets. The plan is to place these in our higher use areas during the Spring fishing season, the summer camping season, and the Fall hunting season.

Regardless of which option for dealing with human waste is selected, we feel our success requires placing the responsibility on the users. Many of these sites are too isolated to be able to afford a toilet at each site. Therefore, the users must accept the responsibility for proper disposal. We have implemented a media blitz, person to person contact and informational signing to ask the users to utilize the "cat hole" method of burying waste. We ask that human waste be buried six inches deep and at least 100 feet from the lake. For larger groups and for longer stays, we allow the construction of latrines, asking that the waste be covered after each use, completely filled in when leaving and removal of any seats or shielding materials used.

The low level of funding has made dealing with both the sedimentation and human waste problems difficult. Success will hinge on user compliance and the utilization of the Senior Citizen Employment Program. We feel that continued monitoring will help "fine tune" which of these methods is most successful. These same methods will then be utilized in two other heavily used dispersed camping areas on the District.

Establishment of Site Work Priorities

The basic goal of this program is to improve dispersed camping opportunities and correct any environmental damage. Therefore, priorities were set based on amount of public use, suitability of site for dispersed camping use, and amount of environmental damage caused by the bare soil area, site distance from the lake and lack of toilet facilities. Therefore, sites were prioritized based on bare area size, closeness to lake, and amount of public use. Sites for toilet placement were determined by reviewing site location and clustering of sites.

Budget analysis and management support determined that approximately \$10,000 per year for materials and one five person Senior Citizen crew was available. This information was then used to determine work schedule based on a five year period to rework all of the sites. I decided to prepare only a three year schedule of work to allow us to proceed with the work and to reanalyze the effectiveness of the work performed and to reinventory all sites. This reanalysis will allow us to determine several important factors. First, it permits us to determine if cost estimates are accurate and tells us if we will be able to speed up or need to slow down rehabilitation of these sites? Second, are these measures working and which will work best? Thirdly, does any additional work need to be done? Are the facilities located where needed? Are shrubbery screens needed?

The first step in prioritizing work was to determine that all sites were suitable for dispersed camping. This determination was made from several factors such physical characteristics such as size and slope; available parking, impact on other resources or users. Two sites(21 & 31) were chosen to be eliminated and closed out due to their unsuitability for dispersed camping. Two locations were determined to be suitable for location of the SST toilets in years one and two, due to the clustering of sites in this area.

TABLE 2: Site Ranking By Size of Bare Soil, Distance to Lake, & Amount of Use

Site Ranking based on Bare Soil Area				1	Site Ranking Based on Distance to Lake			
R	S	R	S	1	R	S	R	S
A	I	A	I	1	A	I	A	I
N	T	N	T	1	N	T	N	T
K	E	K	E	1	K	E	K	E
1	6	14	1	1	1	4	14	43
2	15	15	12	1	2	7	15	12
3	28	16	2	1	3	2	16	17
4	5	17	13	1	4	35	17	16
5	4	18	14	1	5	36	18	26
6	45	19	20	1	6	48	19	47
7	18	20	19	1	7	38	20	44
8	7	21	17	1	8	37	21	51
9	9	22	22	1	9	40	22	34
10	11	23	3	1	10	39	23	15
11	10	24	41	1	11	31	24	11
12	8	25	50	1	12	41	25	50
13	23			1	13	32		

Site Ranking by Amount of Public Use

High	Medium	Low
1	36	15
2	37	19
4	38	20
6	39	25
7	40	26
9	41	27
12	42	28
16	43	30
17	44	33
18	45	34
21	46	
22	47	
23	48	
24	49	
29	50	
31	51	
32		

Schedule of Site Work for Years 1,2, & 3

Site No.	Bare Soil Rank	Dist to Lake Rank	Work Needed	Est. Material Cost
4	5	1	T,P,C,F	\$550
7	8	2	P,L,F	\$275
2	16	3	T,P,L,F	\$475
11	10	24 L	P,L,F	\$275
12	15	15	G(5),P,L,F	\$325
17	21	16	G(6),T,P,L,F	\$535
41	24	12	G(20),T,P,L,F	\$675
50	25	25	G(20),T,P,L,F	\$675
1	14	>25	T,P,L,F	\$475
6	1	>25	G(15),P,L	\$375
End of YEAR 1			TOTALS-G=66,T=6,P=10,L=9	<u>\$4635</u>
45	6	>25	G(20),T,P,L(2),F	\$550
18	7	>25	G(15),T,P,L,F	\$625
9	9	>25	G(5),P,L,F	\$325
23	13	>25	G(8),T,P,L,F	\$555
36	>25	5	T,P,L,F	\$475
48	>25	6	G(5),T,P,L,F	\$525
38	>25	7	T,P,L,F	\$475
37	>25	8	T,P,L,F	\$475
40	>25	9	T,P,L,F	\$475
39	>25	10	T,P,L,F	\$475
End of YEAR 2			TOTALS-G=53,T=9,P=10,L=10,F=10	<u>\$4955</u>
22	22	>25	T,P,L,F	\$475
15	2	23	T,P,L,F	\$475
28	3	>25	T,P,L,F	\$475
32	>25	13	T,P,L,F	\$475
43	>25	14	G(5),T,P,L,F	\$525
16	>25	17	G(4),T,P,L,F	\$515
47	>25	19	G(5),T,P,L,F	\$525
44	>25	20	G(2),T,P,L,F	\$485
51	>25	21	T,P,L,F	\$475
10	11	>25	T,P,L,F	\$475
End of YEAR 3			TOTALS-G=16,T=10,P=10,L=10,F=10	<u>\$4900</u>

T=Table=\$200

L=Lantern Post=\$75=Moveable

P=Pad=\$150=14 crossties & 4 tons of wood chips

C=Trash Can=\$150

F=Fire Ring=\$50

G=Gravel(Tons)=\$10

Conclusion and Recommendations

The recommendations of this project are to better monitor, maintain, and correct existing problems. To begin a rehabilitation project with the goal of rehabilitating all sites within a five year period. It was determined that ten sites per year could be rehabilitated. A schedule was developed for the first three years of the project. By the end of Year 3, all the sites that rank as High for public use and in either of the top 25 rankings for bare soil or for proximity to the lake will have been rehabilitated. Following this period another thorough inventory and analysis would be conducted to evaluate the previous work and establish priorities for completion of the project. This will be followed with a complete inventory every three years and ongoing monitoring via the Senior Citizen crew assigned to these areas and the responsible Recreation Technician.

Two sites(Sites 21 & 31) were determined to be unsuitable to dispersed camping and will be closed. Two SST toilets will be placed in concentrated use areas(near Sites 36 & 45). Ten sites will be rehabilitated in each of the first three years. In these sites a Recreation Technician will locate boulders and plantings and supervise their placement. The Rec Tech will order gravel needed for hardening the parking areas and will flag the locations for the use area, table, fire ring, and any needed trails or steps. This will allow a complete rehabilitation of all lakeside dispersed camping sites and to monitor and alter the practices implemented.